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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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7590 Haverstock & Owens LLP 162 North Wolfe Road Sunnyvale, CA 94086		02/04/2008	EXAMINER BAND, MICHAEL A	
			ART UNIT 1795	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/798,598

Applicant(s)

REI ET AL.

Examiner

Michael Band

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-6,9-19,21-23 and 26-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6,9-19,21-23 and 26-43 is/are rejected.
- 7) ☒ Claim(s) 2 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 2 and 19 are objected to under 37 CFR 1.75 as being a substantial duplicate of claim 1 and 18, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 2 and 19 are rejected for containing identical subject matter in independent claims 1 and 18, respectively.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-2, 4-5, 15-19, 21-22, 31-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makrides et al (US Patent No. 3,350,846) in view of Lee et al (US Patent No. 6,379,524), Steinberg et al (US Patent No. 4,055,686), and Harris (US Patent No. 4,313,013).

With respect to claims 1-2, 17, 18-19, and 33-42 Makrides et al depicts a hydrogen diffusion membrane (figure 1) with a metal (part 2) composed of Group 5 elements (vanadium, tantalum, and niobium) with two layers of palladium (parts 4 and 6). Part 2 is etched (i.e. filled), where the palladium is sputtered onto both sides to form films part 4 and part 6 (col. 3, lines 30-39). It is well known that DC sputtering is a preferred method for sputtering conductive metals (i.e. palladium) as evidenced by Hariu et al (Document U of PTO-892, p. 1, filed 06-21-2007). Makrides et al is also limiting in that while both palladium films are deposited via sputtering or evaporation (col. 3, lines 46-48), it is not specifically suggested to use electroless plating for one of the palladium films. Lee et al teaches a process for manufacturing a composite membrane for separation of hydrogen gas using palladium, which employs the step of electroplating under vacuum an alloy of a palladium compound and a transition metal

(abstract), where the transition metal is a Group VA element, such as Ta (tantalum), Nb (niobium), and V (vanadium) (col. 3, lines 59-64). Lee et al further teaches that "some porous support materials according to this invention may include conductive metals such as stainless steel" (col. 4, lines 29-31). Lee et al cites the advantages of a porous stainless steel support as a lower material cost, little occurrence of corrosion or crack, easier processing, and higher mechanical strength for modulation (col. 2, lines 4-16), prepping (i.e. activating) the stainless steel support in a temperature range of 4°C (col. 5, lines 40-45) and 800°C (col. 6, lines 10-15). In addition, Lee et al discusses plating methods designed to prepare a palladium composite membrane by means of coating palladium metal membrane and palladium alloy membrane on a porous support includes electroless plating (col. 2, lines 17-20). Lee et al also states a manufacturing example of a plating solution (i.e. electroless plating) derived from palladium alloy (col. 5, lines 35-60). It is known that electroless plating a palladium metal involves using a palladium salt solution, as evidenced by Nogami et al (US Patent No. 6,059,940; col. 1, lines 29-33). Lee et al cites the advantages of using an electroless plating solution and a porous support as a composite membrane with better permeation and separation coefficient (col. 1, lines 9-11).

Electroless plating is known to encompass a chemical reaction in an aqueous solution, where hydrogen is released (i.e. evaporated) as evidenced by www.wikipedia.com (Document U of PTO-892, p. 2, filed 06-21-2007).

Since Makrides et al depicts two different palladium layers (figure 1, parts 4 and 6) and different methods of depositing the palladium layers (sputtering and evaporation;

col. 3, lines 46-48), it would have been obvious to one of ordinary skill in the art to deposit one layer via electroless plating as suggested by Lee et al and deposit the other (i.e. additional) layer via sputtering described by Makrides et al in order to gain the advantages of better permeation and separation coefficient.

However modified Makrides et al is further limited in that while it is discussed to activate the support, it is not suggested to polish the substrate holder.

Steinberg et al teaches a method of forming metal hydride films on a surface of a substrate that rests on a stainless steel shroud which is on top of the substrate holder (abstract; col. 2, lines 65-67). Steinberg et al further teaches that metal hydride films are used in hydrogen diffusion applications (col. 1, lines 33-36). Polishing of the substrate, and thus stainless steel shroud, is by mechanically polishing with number 600 emery paper (col. 4, lines 43-45) followed by cleaning with ultrasonic bath (col. 4, lines 58-59). Etching (i.e. acid-washing) with 10% HCl aqueous solution is also discussed (col. 3, lines 52-53) along with sputter etching (i.e. electro-polishing) via DC and radio frequency sputter etching after filling the substrate, and therefore support, with a metal hydride (col. 2, lines 29-59). Steinberg et al cites the advantage of cleaning as providing a substrate system tolerant to a difference between the coefficients of expansion of the film and substrate due to a strong bond between the film and substrate (col. 2, lines 12-19).

It would have been obvious to one of ordinary skill in the art to use the polishing and cleaning methods taught in Steinberg et al for modified Makrides et al to gain the

advantages of tolerance in differences of coefficients of expansion between the film and substrate.

However modified Makrides et al is further limited in that while it is discussed to activate the heat the membrane, it is not specifically suggested to anneal said membrane.

Harris discloses a palladium or palladium alloy hydrogen diffusion membrane (abstract) and method of treating (i.e. annealing) the membrane with heat for a specific time in a specific atmosphere (col. 2, lines 53-67), citing the advantage of the treatment as a production and recovery of hydrogen from a hydrocarbon source (col. 1, lines 43-47).

It would have been obvious to one of ordinary skill to use the treatment method taught in Harris for the manufacturing method of modified Makrides et al in order to gain the advantages of production and recovery of hydrogen from a hydrocarbon source.

With respect to claims 4-5 and 21-22, Makrides et al further depicts figure 1 with part 2 being a tantalum foil (col. 3, lines 32-33). Makrides et al also suggests that tantalum and niobium are interchangeable (col. 2, lines 70-72; col. 3, lines 1-3). Furthermore it is well known that tantalum, niobium, and palladium are commercially available as either foils or powders (www.webelements.com, Documents V, W, X of PTO-892, p. 1, filed 06-21-2007).

With respect to claims 15 and 32, modified Makrides et al further discloses that the metals from Group V-B (Nb, Ta, and V) have a thickness of 0.001 inch (25.4 μm)

and the palladium films have a thickness each of 1000 angstroms (0.1 μm) (col. 4, lines 30-35), giving a total palladium membrane thickness of 25.4 μm .

With respect to claims 16, 31, and 43, Harris discloses a palladium or palladium-silver alloy hydrogen diffusion membrane (abstract; col. 2, lines 26-32) and method of treating (i.e. annealing) the membrane with heat for a specific time in a specific atmosphere (col. 2, lines 53-67). Temperatures of between 350°C and 450°C are used at a time period between 0.1 and 10 hours (col. 2, lines 64-67). Harris also states that hydrogen, argon, or nitrogen gas are used, either static (i.e. atmosphere) or flowing. Furthermore, Harris conducts an example of this with the argon stream being analyzed to determine its content, which is depicted in Table 1 (col. 3, lines 64-68). Table 1 depicts a hydrogen content in the range of 6.6-13.0. Harris cites the advantage of the treatment as a production and recovery of hydrogen from a hydrocarbon source (col. 1, lines 43-47).

7. Claims 6 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makrides et al (US Patent No. 3,350,846), Lee et al (US Patent No. 6,379,524), Steinberg et al (US Patent No. 4,055,686), and Harris (US Patent No. 4,313,013) as applied to claims 5 and 22 above, and further in view of Kimura (US Patent No. 4,574,056).

With respect to claims 6 and 23, the references are cited as discussed for claims 5 and 22. However modified Makrides et al is limited in that it is not suggested to mix the metal powder with a palladium paste and epoxy resin.

Kimura '056 teaches electroconductive pastes that are used to bond semiconductor elements (i.e. metals) onto substrates (abstract; col. 1, lines 18-21). Furthermore, Kimura '056 discusses electroconductive pastes known in the art include those produced by blending fine electroconductive powders of palladium and heat-resistant binders such as epoxy resin (col. 2, lines 58-63). Kimura '056 cites the advantage of using this paste as not requiring any undercoat electrode treatment (col. 1, lines 34-37).

It would have been obvious to one of ordinary skill in the art to use the palladium paste and epoxy resin taught in Kimura '056 for the membrane of modified Makrides et al in order to gain the advantage of not requiring an undercoat electrode treatment for the substrate and layers.

8. Claims 9 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makrides et al (US Patent No. 3,350,846), Lee et al (US Patent No. 6,379,524), Steinberg et al (US Patent No. 4,055,686), and Harris (US Patent No. 4,313,013) as applied to claims 1 and 18 above, and further in view of Harkness (US Patent No. 6,265,086).

With respect to claims 9 and 26-27, the references are cited as discussed for claims 1 and 18. However modified Makrides et al is limited in that while it is disclosed that a silver-palladium alloy is electroless plated, the salt solution is not specified.

Harkness '086 teaches a method for selective electroless metal deposition on a substrate (abstract). Harkness '086 further teaches suitable sources of metal ions include salts of metals, such as palladium acetate and silver nitrate, with a

concentration in the range of about 0.001 to about 10 weight percent (col. 6, lines 20-29). Furthermore, Harkness '086 states that "electroless plating solutions also often contain solvents for the metal salt, suitable reducing agents, bases, complexing agents to solubilize the metal salt and special additives to control the solution stability and plating rate (col. 6, lines 30-33). Harkness '086 suggests a reducing agent of hydrazine (NH_2NH_2) with a concentration range of about 0.01 to about 10 weight percent (col. 6, lines 38-39), a base of ammonium hydroxide (NH_4OH) with a concentration of 0.01 to about 10 weight percent (col. 6, lines 45-46), and a complexing agent of EDTA with a concentration range of about 0.01 to about 10 weight percent (col. 6, lines 52-54).

It has been held that differences in concentration or temperature will not support patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

It would have been obvious to one of ordinary skill in the art to use a solution of compounds taught by Harkness '086 for the solution of modified Makrides et al in order to gain the advantages of controlling the solution stability and plating rate.

9. Claims 10-11 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makrides et al (US Patent No. 3,350,846), Lee et al (US Patent No. 6,379,524), Steinberg et al (US Patent No. 4,055,686), and Harris (US Patent No. 4,313,013) as applied to claims 1 and 18 above, and further in view of Stevens et al (USPGPub 2003/0141018).

With respect to claims 10-11 and 28, Makrides et al depicts a hydrogen diffusion membrane (figure 1) with a metal (part 2) composed of Group 5 elements (vanadium, tantalum, and niobium) with two layers of palladium (parts 4 and 6). Part 2 is etched (i.e. filled), where the palladium is sputtered onto both sides to form films part 4 and part 6 (col. 3, lines 30-39). It is well known that DC sputtering is a preferred method for sputtering conductive metals (i.e. palladium) as evidenced by Hariu et al (Document U of PTO-892, p. 1, filed 06-21-2007). Makrides et al further discloses that a palladium-silver alloy may be used for the membrane (col. 5, lines 28-35), thus a palladium membrane and a silver membrane is formed. However Makrides et al is limiting in that while both palladium films are deposited via sputtering or evaporation (col. 3, lines 46-48), it is not specifically suggested to use electroless plating.

Lee et al teaches a process for manufacturing a composite membrane for separation of hydrogen gas using palladium, which employs the step of electroplating under vacuum an alloy of a palladium compound and a transition metal (abstract), where the transition metal is a Group VA element, such as Ta (tantalum), Nb (niobium), vanadium (V), and silver (Ag) (col. 3, lines 59-64). Furthermore, Lee et al discusses plating methods designed to prepare a palladium composite membrane by means of coating palladium metal membrane and palladium alloy membrane on a porous support includes electroless plating (col. 2, lines 17-20). Lee et al also states a manufacturing example of a plating solution (i.e. electroless plating) derived from palladium alloy (col. 5, lines 35-60). It is known that electroless plating a palladium metal involves using a palladium salt solution, as evidenced by Nogami et al (US Patent No. 6,059,940; col. 1,

lines 29-33). Lee et al further describes that "some porous support materials according to this invention may include conductive metals such as stainless steel" (col. 4, lines 29-31). Lee'524 also states that electroless plating takes 30 minutes (col. 5, lines 40-45), with an additional 2 hours (120 minutes) of deposition time used in example 2 (col. 6, lines 10-25). Lee et al cites the advantages as a composite membrane with better permeation and separation coefficient (col. 1, lines 9-11), lower material cost, little occurrence of corrosion or crack, easier processing, and higher mechanical strength for modulation (col. 2, lines 13-16).

Electroless plating is known to encompass a chemical reaction in an aqueous solution, where hydrogen is released (i.e. evaporated) as evidenced by www.wikipedia.com (Document U of PTO-892, p. 2, filed 06-21-2007. Since Makrides et al depicts two different palladium layers (figure 1, parts 4 and 6) and different methods of depositing the palladium layers (sputtering and evaporation; col. 3, lines 46-48), it would have been obvious to one of ordinary skill in the art to deposit one layer via electroless plating as suggested by Lee et al and deposit the other (i.e. additional) layer via sputtering described by Makrides et al in order to gain the advantages of better permeation and separation coefficient.

In addition, Makrides et al is limiting in that a specific temperature is not suggested for the electroless plating.

Stevens et al teaches an electroless deposition apparatus comprising at least one metal selected from the group consisting of noble metals, semi-noble metals, alloys

therof (abstract), with examples of noble metals being silver and palladium (p. 2, para 13). Furthermore, Stevens et al discusses electroless deposition of palladium at a preferred temperature between 20°C and 80°C, with temperature between 40°C and 60°C even more preferred (p. 12, para 0109). Stevens et al states the advantage of heating as an enhancement of the properties of the deposited materials (p. 10, para 88).

It would have been obvious to one of ordinary skill in the art to use the temperatures taught in Stevens et al in the modified process of Makrides et al in order to gain the advantage of enhanced properties of the palladium-silver membrane.

It has been held that in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

With respect to claim 29, modified Makrides et al further discloses "a palladium-silver alloy containing silver in an amount falling within the range of about 10 percent to about 50 percent weight" (col. 5, lines 33-35), leading to a weight percent ratio of palladium/silver of about 90/10 to 50/50.

It has been held that differences in concentration or temperature will not support patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Makrides et al (US Patent No. 3,350,846), Lee et al (US Patent No. 6,379,524), Steinberg et al (US Patent No. 4,055,686), and Harris (US Patent No. 4,313,013) as

applied to claim 1 above, and further in view of Kulkarni et al (US Patent No. 6,283,357).

With respect to claim 12, the references are cited as discussed for claim 1. However modified Makrides et al is limited in that while it disclosed that palladium is sputtered and thus a palladium target is used, the palladium purity is not specified.

Kulkarni et al teaches a method for forming sputter targets (abstract). Kulkarni et al further teaches that "the sputter target material is a metal, metal oxide, metal silicide or alloy which is to be deposited" onto a substrate, "and is advantageously a highly pure material, preferably having a purity of 99% to 99.99999%" (col. 3, lines 35-38). "These materials include, for example, pure metals, alloys, [silicides], and oxides of tantalum, titanium, tungsten, copper, nickel, chromium, aluminum, cobalt, molybdenum, silver, gold, platinum, ruthenium, rhodium, palladium, iron, bismuth, germanium, niobium, and vanadium (col. 3, lines 38-43).

It would have been obvious to one of ordinary skill in the art to use the palladium sputter target purity taught in Kulkarni et al for the palladium sputter target of Makrides et al since Makrides et al fails to disclose a specific target purity and one of ordinary skill would have a reasonable expectation of success in selecting such a purity.

11. Claims 13 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makrides et al (US Patent No. 3,350,846), Lee et al (US Patent No. 6,379,524), Steinberg et al (US Patent No. 4,055,686), and Harris (US Patent No. 4,313,013) as

applied to claim 1 above, and further in view of Gopalraja et al (USPGPub 2004/0094402).

With respect to claims 13 and 30, the references are cited as discussed for claim 1 and 18. However modified Makrides et al is limited in that while sputtering is disclosed, specific vacuum pressures, power input, and temperature are not specified.

Gopalraja et al teaches a DC magnetron sputtering (abstract) for palladium (Pd) and silver (Ag) deposition materials (p. 3, para 0016) while also suggesting electrochemical plating (i.e. electroless plating) and electroplating (p. 3, para 0021-0022). Furthermore, Gopalraja et al discusses suitable pressure ranges as 1-30 mTorr or 1-5 mTorr (p. 5, para 0043) accompanied with temperatures between 50 to 70°C (p. 2, para 0014). Gopalraja et al also discusses a power source capable of biasing a pedestal, where the power range is preferred from 150 to 300 W (p. 5, para 0053). Gopalraja et al cites the advantage to sputtering using these parameters as confining the plasma generated by capacitive coupling to increase the plasma density, leading to an increased ionization rate in addition to the process being promoted at low pressure (p. 3, para 0024-0025).

It would have been obvious to one of ordinary skill in the art to use the parameters specified for a DC sputtering magnetron taught in Gopalraja et al for the sputtering apparatus of modified Makrides et al in order to gain the advantages of superior ionization and improved process at lower pressures.

It has been held that in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Makrides et al (US Patent No. 3,350,846), Lee et al (US Patent No. 6,379,524), Steinberg et al (US Patent No. 4,055,686), and Harris (US Patent No. 4,313,013) as applied to claim 1 above, and further in view of Matsuzaki et al (USPGPub 2004/0238356).

With respect to claim 14, the references are cited as discussed for claim 1. However modified Makrides et al is limited in that while sputtering the palladium is discussed, the amount of time for sputtering is not specified.

Matsuzaki et al teaches a silver alloy sputtering target (abstract) with palladium being a component of the alloy (p. 1, para 3). Matsuzaki et al further teaches a holding time of 0.75 to 3 hours (45 mins to 180 mins) (p. 4, para 48) for DC magnetron sputtering (p. 5, para 69).

It would have been obvious to one of ordinary skill in the art to use the holding time set forth in Matsuzaki et al for the sputtering time of modified Makrides et al since modified Makrides et al fails to disclose a specified time and one of ordinary skill would have a reasonable expectation of success in making the modification.

Response to Arguments

Objections

13. The Applicant has amended the specification to read 8~10 N HCl and 10N HCl to read as 8~10 M HCl and 10M HCl. Therefore the objection is withdrawn.

14. The Applicant has cancelled claims 3 and 20. Therefore the objections are moot.

102 & 103 rejections

15. Applicant's arguments with respect to claims 1-2, 4-6, 9-19, 21-23, and 26-43 have been considered but are moot in view of the new ground(s) of rejection since polishing, washing, and activating a stainless steel support has been added to independent claims 1, 17, 18, and 33.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 8am-4pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

18. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./

Examiner, Art Unit 1795



ALEXA D. NECKEL
SUPERVISORY PATENT EXAMINER